Public Abstract
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Symmetries can be attributed to physical states or physical laws. A symmetry can be exact, approximate or broken. Exact symmetry means that the symmetry is unconditionally valid, approximate means its valid under certain conditions and broken symmetry can be interpreted in various ways. This thesis emphasizes on some interesting as well as distinct results of minuscule asymmetric disturbances and their effects on the symmetry and structures. Even minuscule difference in the magnitude of forces acting on symmetrical structures can result in an asymmetric response. This can result in a remarkable difference in the buckling point of a structure. This might also be a major contributing factor for failure in structures; may it be structures used in large complex assemblies or in Micro Electromechanical systems.

A truss element may be quintessential to prove symmetry breaking and its remarkable effects due to minuscule anomaly in symmetry. If we consider truss structures alone, the results are intriguing. In the past there have been numerous instances of failure of truss structures of various sizes and in different applications. In many of such instances the causes of failure were attributed to load exceeding critical load. A thorough study on asymmetric responses show that buckling load drops down for an asymmetric response when compared to the symmetric response for the same material properties and geometrical boundary conditions. Hence studying the asymmetric responses of structures can help designing better components resulting in less number of failures